## **CLAIMS**

What is claimed is:

- 1 1. An organophotoreceptor comprising an electrically conductive substrate 2 and a photoconductive element on the electrically conductive substrate, the 3 photoconductive element comprising: 4 (a) a charge transport compound having the formula 5 6 R<sub>1</sub> is an aromatic group, an alkyl group, an alkenyl group, or a 7 heterocyclic group; 8 R<sub>2</sub> comprises an (N,N-disubstituted)arylamine group; 9 R<sub>3</sub> comprises an epoxy group; 10 R<sub>4</sub> is H, an aromatic group, an alkyl group, an alkenyl group, or a 11 heterocyclic group; and 12 X is a first linking group; and 13 (b) a charge generating compound.
- 2. An organophotoreceptor according to claim 1 wherein the (N,N-disubstituted)arylamine group is selected from the group consisting of a p-(N,N-disubstituted)arylamine group, a carbazole, and a julolidine group.
- 3. An organophotoreceptor according to claim 1 wherein X is a -(CH<sub>2</sub>)<sub>m</sub>group, where m is an integer between 1 and 30, inclusive, and one or more of the
  methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a
  heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a
  CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H,
  hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a
  heterocyclic group, an aromatic group, or part of a ring group.

1 4. An organophotoreceptor according to claim 1 wherein R<sub>2</sub> has the formula

$$R_{3}$$

$$N$$

$$R_{1}$$

$$R_{4}$$

where  $R_1$ ' is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;

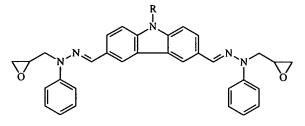
R<sub>2</sub>' is selected from the group consisting of a carbazole group or a p-(N,N-disubstituted)arylamine group;

R<sub>3</sub>' comprises an epoxy, a hydroxyl, a thiol, a carboxyl or an amine group;

 $R_4$ ' is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group; and

10 X' is a second linking group.

- 5. An organophotoreceptor according to claim 4 wherein X' is a -(CH<sub>2</sub>)<sub>n</sub>-group, where n is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.
- 6. An organophotoreceptor according to claim 5 wherein the charge transport compound is selected from the group consisting of:



where R is hydrogen, an alkyl group, an aromatic group, or a heterocyclic group,

and

- 1 7. An organophotoreceptor according to claim 1 further comprising 2 an electron transport compound.
- 1 8. An organophotoreceptor according to claim 1 wherein the 2 organophotoreceptor is in the form of a drum or a belt.
- 1 9. An organophotoreceptor according to claim 1 comprising:
- 2 (a) a charge transport layer comprising the charge transport compound 3 and a polymeric binder; and
- 4 (b) a charge generating layer comprising the charge generating compound and a polymeric binder.
- 1 10. An electrophotographic imaging apparatus comprising:
  - (a) a light imaging component; and
  - (b) an organophotoreceptor oriented to receive light from the light imaging component, the organophotoreceptor comprising an electrically conductive substrate and a photoconductive element on the electrically conductive substrate, the photoconductive element comprising:
    - (i) a charge transport compound having the formula

$$R_4$$
 $R_2$ 
 $N$ 
 $R_1$ 

8 9

2

3

4

5

6

7

R<sub>1</sub> is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;

10 R<sub>2</sub> comprises an (N,N-disubstituted)arylamine group;

 $R_3$  comprises an epoxy group;

12 R<sub>4</sub> is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic

13 group; and

14 X is a first linking group; and

15 (ii) a charge generating compound.

- 1 11. An electrophotographic imaging apparatus of claim 10 wherein the (N,N-
- 2 disubstituted)arylamine group is selected from the group consisting of a p-(N,N-
- disubstituted) aryl amine group, a carbazole, and a julolidine group.
- 1 12. An electrophotographic imaging apparatus of claim 10 wherein X is
- 2 a -(CH<sub>2</sub>)<sub>m</sub>- group, where m is an integer between 1 and 30, inclusive, and one or more of
- 3 the methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a
- 4 heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a
- 5 CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H,
- 6 hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a
- 7 heterocyclic group, an aromatic group, or part of a ring group.
- 1 13.An electrophotographic imaging apparatus of claim 10 further comprising a
- 2 toner dispenser.
- 1 14. An electrophotographic imaging apparatus of claim 10 wherein the
- 2 organophotoreceptor further comprises an electron transport compound.
- 1 15. An electrophotographic imaging apparatus of claim 10 wherein  $R_2$  has the
- 2 formula

- where R<sub>1</sub>' is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;
- R<sub>2</sub>' is selected from the group consisting of a carbazole group or a p-(N,N-disubstituted)arylamine group;
- R<sub>3</sub>' comprises an epoxy group, a hydroxyl group, a thiol group, a carboxyl group, or an amine group;
- $R_4$ ' is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group; and
- 12 X' is a second linking group.

- 1 16. An electrophotographic imaging apparatus of claim 15 wherein X' is 2 a -(CH<sub>2</sub>)<sub>n</sub>- group, where n is an integer between 1 and 30, inclusive, and one or more of 3 the methylene groups is optionally replaced by Ó, S, N, C, B, P, C=O, O=S=O, a 4 heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a 5 CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.
- 1 17. An electrophotographic imaging apparatus of claim 16 wherein the charge 2 transport compound is selected from the group consisting of:

4 where R is hydrogen, an alkyl group, an aromatic group, or a heterocyclic group, and

- 1 18. An electrophotographic imaging process comprising: 2 (a) applying an electrical charge to a surface of an organophotoreceptor 3 comprising an electrically conductive substrate and a photoconductive element on the
- 4 electrically conductive substrate, the photoconductive element comprising:

$$R_4$$
 $N$ 
 $R_1$ 
 $R_2$ 

(i) a charge transport compound having the formula

6

10

11

17

- $R_1$  is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;
- 8 R<sub>2</sub> comprises an (N,N-disubstituted)arylamine group;
- 9 R<sub>3</sub> comprises an epoxy group;
  - R<sub>4</sub> is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group; and
- 12 X is a first linking group; and
- 13 (ii) a charge generating compound;
- 14 (b) imagewise exposing the surface of the organophotoreceptor to 15 radiation to dissipate charge in selected areas and thereby form a pattern of 16 charged and uncharged areas on the surface;
  - (c) contacting the surface with a toner to create a toned image; and
- (d) transferring the toned image to a substrate.

- 1 19. An electrophotographic imaging process of claim 18 wherein the (N,N-2 disubstituted)arylamine group is selected from the group consisting of a p-(N,N-3 disubstituted)arylamine group, a carbazole, and a julolidine group.
- 20. An electrophotographic imaging process of claim 18 wherein X is a -(CH<sub>2</sub>)<sub>m</sub>- group, where m is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.
- 1 21. An electrophotographic imaging process of claim 18 wherein the 2 organophotoreceptor further comprises an electron transport compound.
- 1 22. An electrophotographic imaging process of claim 18 wherein  $R_2$  has the 2 formula

$$R_{3}$$
 $N$ 
 $R_{1}$ 
 $N$ 
 $R_{2}$ 

where R<sub>1</sub>' is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;

R<sub>2</sub>' is selected from the group consisting of a carbazole group or a p-(N,N-disubstituted)arylamine group;

R<sub>3</sub>' comprises an epoxy group, a hydroxyl group, a thiol group, a carboxyl group, or an amine group;

 $R_4$ ' is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group; and

12 X' is a second linking group.

3

6

7

8

- 23. An organophotoreceptor according to claim 22 wherein X' is a -(CH<sub>2</sub>)<sub>n</sub>-group, where n is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.
- 1 24. An electrophotographic imaging process of claim 23 wherein the charge 2 transport compound is selected from the group consisting of:

where R is hydrogen, an alkyl group, an aromatic group, or a heterocyclic group, and

5

1

25. A charge transport compound having the formula

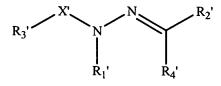
$$R_4$$
 $R_2$ 
 $N$ 
 $R_3$ 
 $R_1$ 

2

where  $R_1$  is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;

- 5 R<sub>2</sub> comprises an (N,N-disubstituted)arylamine group;
- 6 R<sub>3</sub> comprises an epoxy group;

- $R_4$  is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group; and
- 9 X is a first linking group.
- 1 26. A charge transport compound of claim 25 wherein the (N,N-disubstituted)
- 2 arylamine group is selected from the group consisting of a p-(N,N-disubstituted)aryl
- 3 amine group, a carbazole, and a julolidine group.
- 1 27. An electrophotographic imaging process of claim 25 wherein X is
- 2 a -(CH<sub>2</sub>)<sub>m</sub>- group, where m is an integer between 1 and 30, inclusive, and one or more of
- 3 the methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a
- 4 heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a
- 5 CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H,
- 6 hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a
- 7 heterocyclic group, an aromatic group, or part of a ring group.
  - 28. A charge transport compound of claim 25 wherein R<sub>2</sub> has the formula



- where  $R_1$ ' is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;
- R<sub>2</sub>' is selected from the group consisting of a carbazole group or a p-(N,N-disubstituted)arylamine group;
- R<sub>3</sub>' comprises an epoxy group, a hydroxyl group, a thiol group, a carboxyl group, or an amine group;
- $R_4$  is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group; and
- 11 X' is a second linking group.

29. A charge transport compound of claim 28 wherein X' is a -(CH<sub>2</sub>)<sub>n</sub>- group, where n is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.

1 30. A charge transport compound of claim 29 wherein the charge transport compound is selected from the group consisting of:

4 where R is hydrogen, an alkyl group, an aromatic group, or a heterocyclic group, and

31. A charge transport composition prepared by the reaction of at least a reactive functionality of a functional binder with at least an epoxy ring in a compound having the formula

$$R_4$$
 $R_2$ 
 $N$ 
 $R_1$ 

where  $R_1$  is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;

- R<sub>2</sub> comprises an (N,N-disubstituted)arylamine group;
- 8 R<sub>3</sub> comprises an epoxy group;
- 9 R<sub>4</sub> is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic
- 10 group; and
- 11 X is a first linking group.
- 1 32. A charge transport composition of claim 31 wherein the reactive
- 2 functionality is selected from the group consisting of hydroxyl, thiol, carboxyl, and an
- 3 amino group.
- 1 33. A charge transport composition of claim 31 wherein the (N,N-
- 2 disubstituted)arylamine group is selected from the group consisting of a p-(N,N-
- disubstituted) aryl amine group, a carbazole, and a julolidine group.
- 1 34. A charge transport composition of claim 31 wherein X is a -(CH<sub>2</sub>)<sub>m</sub>-
- 2 group, where m is an integer between 1 and 30, inclusive, and one or more of the
- 3 methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a
- 4 heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a
- 5 CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H,
- 6 hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a
- 7 heterocyclic group, an aromatic group, or part of a ring group.
  - 35. A charge transport composition of claim 31 wherein  $R_2$  has the formula

where R<sub>1</sub>' is an aromatic group, an alkyl group, an alkenyl group, or a

4 heterocyclic group;

1

- 5 R<sub>2</sub>' is selected from the group consisting of a carbazole group or a p-(N,N-
- 6 disubstituted)arylamine group;

- R<sub>3</sub>' comprises an epoxy group, a hydroxyl group, a thiol group, a carboxyl group, or an amine group;
- 9 R<sub>4</sub>' is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group; and
- 11 X' is a second linking group.
- 36. A charge transport composition of claim 35 wherein X' is a -(CH<sub>2</sub>)<sub>n</sub>-group, where n is an integer between 1 and 30, inclusive, and one or more of the methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring group.
  - 37. A charge transport composition of claim 36 wherein the charge transport compound is selected from the group consisting of:

1

2

where R is hydrogen, an alkyl group, an aromatic group, or a heterocyclic group, and

- 1 38. An organophotoreceptor comprising an electrically conductive substrate 2 and a photoconductive element on the electrically conductive substrate, the 3 photoconductive element comprising:
- 4 (a) a polymeric charge transport compound prepared by the reaction of at
  5 least a reactive functionality of a functional binder with at least an epoxy ring in a
  6 compound having the formula

$$R_4$$
 $N$ 
 $R_1$ 
 $R_2$ 
 $N$ 
 $R_3$ 

- 8 R<sub>1</sub> is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;
- 9 R<sub>2</sub> comprises an (N,N-disubstituted)arylamine group;
- $R_3$  comprises an epoxy group;
- 11 R<sub>4</sub> is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic
- 12 group; and
- 13 X is a first linking group; and
- (b) a charge generating compound.
- 1 39. An organophotoreceptor according to claim 38 wherein the 2 photoconductive element further comprises an electron transport compound.
- 1 40. An organophotoreceptor according to claim 38 wherein the reactive 2 functionality of the binder is selected from the group consisting of hydroxyl, carboxyl 3 group, thiol, and an amino group.
- 1 41. An organophotoreceptor according to claim 38 wherein the (N,N-2 disubstituted)arylamine group is selected from the group consisting of a p-(N,N-3 disubstituted)arylamine group, a carbazole, and a julolidine group.
- 1 42. An organophotoreceptor according to claim 38 wherein X is a -(CH<sub>2</sub>)<sub>m</sub>-2 group, where m is an integer between 1 and 30, inclusive, and one or more of the 3 methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a

- 4 heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a
- 5 CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H,
- 6 hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a
- 7 heterocyclic group, an aromatic group, or part of a ring group.
  - 43. An organophotoreceptor according to claim 38 wherein R<sub>2</sub> has the formula

$$R_{3'}$$
 $N$ 
 $R_{2'}$ 
 $R_{2'}$ 

- where  $R_1$  is an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group;
- R<sub>2</sub>' is selected from the group consisting of a carbazole group or a p-(N,N-disubstituted)arylamine group;
- R<sub>3</sub>' comprises an epoxy group, a hydroxyl group, a thiol group, a carboxyl group, or an amine group;
- $R_4$  is H, an aromatic group, an alkyl group, an alkenyl group, or a heterocyclic group; and
- 11 X' is a second linking group.
- 1 44. An organophotoreceptor according to claim 43 wherein X' is a -(CH<sub>2</sub>)<sub>n</sub>-
- 2 group, where n is an integer between 1 and 30, inclusive, and one or more of the
- 3 methylene groups is optionally replaced by O, S, N, C, B, P, C=O, O=S=O, a
- 4 heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR<sub>6</sub> group, a
- 5 CR<sub>7</sub>, or a CR<sub>8</sub>R<sub>9</sub> group where R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are, each independently, a bond, H,
- 6 hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a
- 7 heterocyclic group, an aromatic group, or part of a ring group.
- 1 45. An organophotoreceptor according to claim 44 wherein the charge
- 2 transport compound is selected from the group consisting of:

4 where R is hydrogen, an alkyl group, an aromatic group, or a heterocyclic group, and